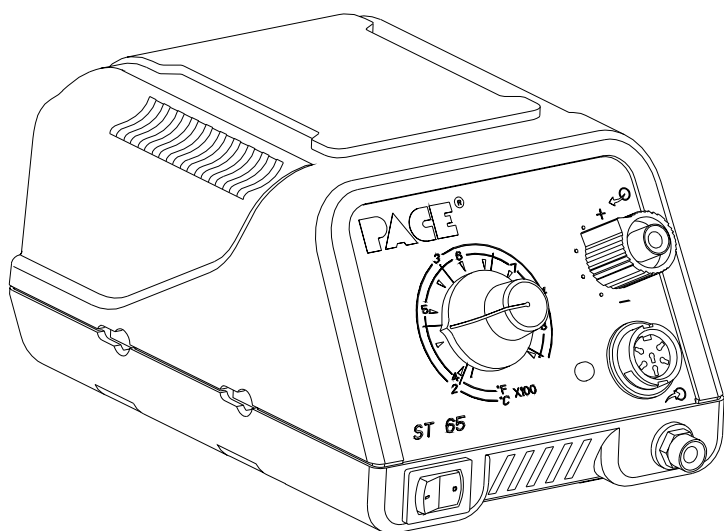


# PAGE<sup>®</sup>

**ST 65 Systems**



**Operation & Maintenance Manual**

# **MANUAL NUMBER 5050-0454**

## **REV. C**

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For any questions regarding this Operation & Maintenance Manual, contact your local authorized PACE distributor or contact PACE directly at the appropriate address listed below.

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# ***General Information***

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## **Introduction**

Thank you for purchasing the PACE model ST 65 Soldering/Desoldering System. This manual will provide you with the information necessary to properly set up, operate and maintain the system. Please read this manual thoroughly before using the system.

The ST 65 systems are available in either the 115 VAC, or 230 VAC version which incorporates a highly responsive SensaTemp (closed loop) control system providing up to 80 Watts of total power to a single output channel. The 230 VAC version system bears the CE Conformity Marking which assures the user that it conforms to all the requirements of council directive EMC 89/336/EEC. The systems package the power source with a selection of accessories and functional aids.

## **Specifications**

### **System Power Source Power Requirements**

- ST 65 - Operates on 97-127 VAC, 50/60Hz, 90 Watts maximum at 115 VAC, 60Hz
- ST 65E - Operates on 197-253 VAC 50/60Hz, 80 Watts maximum at 230 VAC, 50Hz

### **Shop Air Input Requirements:**

- Pressure - 5.48 Bar (80 p.s.i.) recommended  
6.17 Bar (90 p.s.i.) maximum
- Air Flow - 45.3 SLPM (1.6 SCFM) minimum

### **Temperature Specifications**

#### **Handpieces**

Tip Temperature Range: 204 to 454°C (400 to 850°F) nominal.

Temperature Stability:  $\pm 1.1^{\circ}\text{C}$  ( $\pm 2^{\circ}\text{F}$ ) at idle from set tip temp.

**NOTE** - Actual minimum and maximum Operating Tip Temperatures may vary depending on Handpiece, Tip Selection and application.

### **EOS/ESD Specifications**

The specifications shown below apply except on "Soft Ground Systems" which have a 1 meg ohm current limiting resistance and a label placed on the power source front panel referring to EN 100015-1.

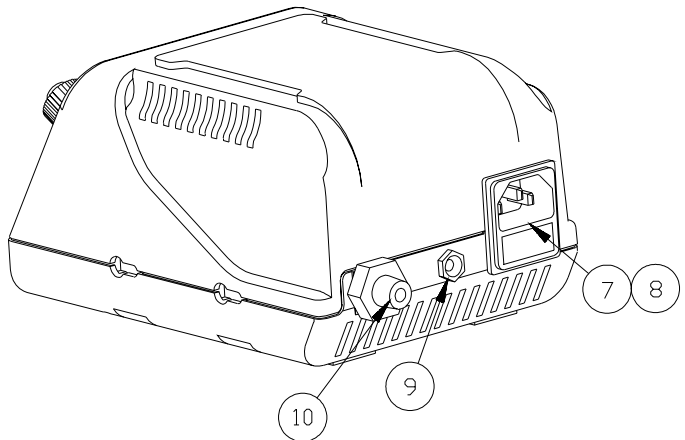
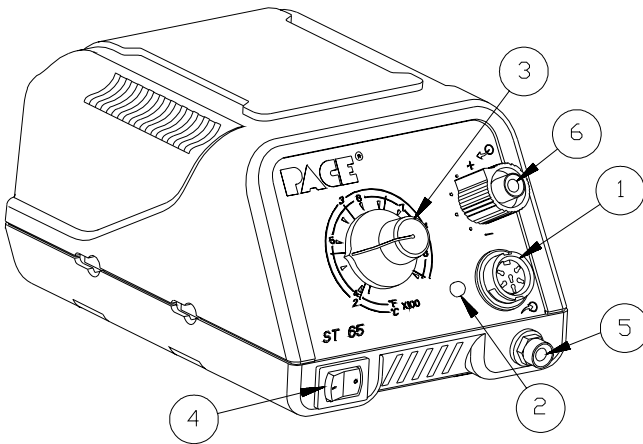
Tip-To-Ground Resistance: Less than 2 ohms.

AC Leakage: Less than 2 millivolts RMS from 50Hz to 100MHz.

Transient Level: Less than 500 mV peak, out to 100MHz.

### Parts Identification

- |                                |   |
|--------------------------------|---|
| ① Power Receptacle             | ⑥ Controllable Pressure Port                        |
| ② LED                          | ⑦ AC Power Receptacle/Fuse Holder                   |
| ③ Variable Temperature Control | ⑧ Fuse  |
| ④ Power Switch                 | ⑨ Earth Ground Receptacle<br>(230 VAC Systems only) |
| ⑤ Vacuum Port                  | ⑩ Air Hose Fitting                                  |



# Safety

---

## Safety Guidelines, English Language

The following are safety precautions which personnel must understand and follow when using or servicing this product.

1. **POTENTIAL SHOCK HAZARD** - Repair procedures on PACE products should be performed by Qualified Service Personnel only. Line voltage parts may be exposed when the equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the product.
2. To prevent personnel injury, adhere to safety guidelines in accordance with OSHA and other applicable safety standards.
3. SensaTemp handpiece heaters and installed tips are hot when the handpiece is powered on and for a period of time after power off. **DO NOT** touch either the heater or the tip. Severe burns may result.
4. PACE Tip & Tool Stands and handpiece cubbies are designed specifically for use with the associated handpiece and houses it in a manner which protects the user from accidental burns. Always store the handpiece in its holder. Be sure to place the handpiece in its holder after use and allow to cool before storing.
5. Always use PACE systems in a well ventilated area. A fume extraction system such as those available from PACE are highly recommended to help protect personnel from solder flux fumes.
6. Exercise proper precautions when using chemicals (e.g., solder paste). Refer to the Material Safety Data Sheet (MSDS) supplied with each chemical and adhere to all safety precautions recommended by the manufacturer.

### Directives de Sécurité, Française Langue

Les précautions suivantes, sont celles que le personnel doit comprendre et suivre lorsqu'il utilise, effectue la maintenance ou se sert d'un produit PACE.

1. **Danger potentiel de choc électrique** - Les procédures de réparation sur les produits PACE doivent être effectuées seulement par du personnel qualifié. Des parties de l'équipement désassemblées peuvent être sous tension. Le personnel de maintenance doit éviter tout contact avec ces parties en réparant le produit.
2. Pour prévenir tout préjudice, le personnel adhère au guide de sécurité en accord avec OSHA (équivalent à des normes françaises de sécurité) et d'autres standards de sécurité applicable.
3. La mise sous tension des outils SensaTemp comporte des éléments chauffants (buse). Ces derniers, gardent la chaleur même après la mise hors tension pendant un certain temps. **Ne pas** toucher les parties chaudes aux extrémités des outils. Des brûlures sévères peuvent en résulter.
4. Les outils PACE et leurs panes ainsi que le support sont dessinés de manière spécifique afin de protéger l'utilisateur/opérateur de brûlures accidentelles. Reposer toujours les outils après chaque utilisation dans leurs étuis/supports afin de permettre leur refroidissement.
5. Utiliser toujours les stations Pace dans un lieu bien ventilé. Des extracteurs de fumée Pace sont hautement recommandés pour protéger votre personnel des vapeurs de soudure/flux.
6. Prenez les mesures nécessaires quand vous utilisez des produits (ex: solder paste) chimiques. Reportez-vous au document (fiche technique/sécurité) du fabricant fourni avec chaque produit. Respectez toutes les procédures de sécurité recommandées par le constructeur.

## *Sicherheit Korrekturlinien, Deutsche Sprache*

Die nachfolgenden Sicherheitsvorschriften sollten vom Bedien- und Servicepersonal verstanden und befolgt werden.

1. **Entladung spannungsfuehrender Teile** - Reparaturen an PACE Produkten sollten nur von qualifizierten Personal durchgefuehrt werden. Spannungsfuehrende Teile koennen sich bei gezogenen Netzstecker entladen. Servicepersonal muss den Kontakt dieser Teile vermeiden.
2. Um moegliche Gefahren fuer Personen auszuschliessen, muessen alle Sicherheitsvorschriften in Uebereinstimmung mit OSHA und anderen anwendbaren Sicherheitsstandards eingehalten werden.
3. Angeschlossene SensaTemp Heizelemente von Handwerkzeugen und installierte Loetspitzen sind heiss wenn das System eingeschaltet ist oder erst vor kurzer Zeit ausgeschaltet wurde. Heizelement und Loetspitze nicht beruehren. Verbrennungsgefahr.
4. PACE Tip & Tool und andere Handwerkzeugablagen sind so konstruiert, dass ein versehentliches Beruehren des dazugehoerendes Handwerkzeuges vermieden wird. Bewahren Sie das Handwerkzeug nach Gebrauch stets in der Ablage auf. Bevor das Handwerkzeug an einem anderen Ort gelagert werden muss, lassen Sie es in der Werkzeugablage vollstaendig abkuehlen.
5. Benutze PACE Systeme nur in gut beluefteten Raeumen. Ein Loetrauchabsaugsystem, wie es z.B. von PACE erhaeltlich ist, hilft Bedienpersonen von den Gefahren von Loetrauch zu schuetzen.
6. Wenn Chemikalien (z.B.: Lotpaste) verwendet werden, muessen alle die in den Sicherheitsdatenblaettern des Herstellers ausgewiesenen Sicherheitsvorschriften eingehalten werden.



### Misure di Sicurezza, Italiana Lingua

Le seguenti istruzioni sono misure di sicurezza che il personale deve comprendere e seguire quando utilizza o ripara I prodotti PACE.

1. **EVENTUALIRISCHIDISHOCKELETTTRICO**-Si consiglia di far eseguire le operazioni di riparazione dei prodotti PACE, da un servizio di personale qualificato. Quando la stazione non é assemblata le parti sottoposte alla tensione di linea potrebbero essere scoperte. Il personale deve evitare il contatto con queste parti durante manutenzione del prodotto.
2. Per evitare eventuali pericoli al personale, attenersi alle norme di sicurezza previste dalla guida, in conformità all' OSHA e agli altri Standard di Sicurezza applicabili.
3. Le resistenze PACE Sensatemp e le punte installate sono calde quando la stazione é accesa e per un periodo successivo allo spegnimento. Non toccare la resistenza e la punta. Può comportare gravi ustioni.
4. I supporti PACE sono specificamente costruiti insieme alla corrispondente impugnatura e progettati per un uso che protegge gli utenti da ustioni accidentali. Mettere sempre l' impugnatura nel proprio supporto dopo l' utilizzo e lasciarla raffreddare prima di riporla.
5. Utilizzare sempre I stazioni PACE in una zona be aerata per proteggere il personale dai fumi. É fortemente raccomandato un sistema di aspirazione (dei fumi) come quello disposta dalla PACE.
6. Usare precauzioni quando si utilizzano sotanze chimiche (es. Pasta di stagno). Fare riferimento al Material Safety Data Sheet (MSDS) fornita con ogni sostanza chimica e seguire tutte le misure di sicurezza raccomandate dal fabbricante.

## Guidelines de Segurança, Portuguese Lingua

Segeum-se precauções de segurança que os operadores devem compreender e seguir ao utilizar ou reparar produtos PACE.

1. **Perigo de choque eléctrico** - Os procedimentos de reparação em produtos PACE, devem ser apenas efectuados por pessoal qualificado. Linhas de alimentação podem ficar expostas ao desmontar o equipamento. Pessoal de reparação deve evitar o contacto com essas partes ao reparar o produto.
2. Para evitar danos pessoais, siga as normas de segurança OSHA ou outras normas aplicáveis.
3. Resistencias de aquecimento dos ferros e as pontas instaladas estão quentes quando o ferro está alimentado, e mesmo durante algum tempo após ser desligado. **NUNCA TOCAR** nem na resistencia de aquecimento nem na ponta. Pode resultar em queimaduras severas.
4. Os suportes para pontas e ferros da PACE, foram concebidos para uso específico, e para proteger o operador de queimaduras acidentais. Coloque sempre os ferros nos respectivos suportes. Tenha a certeza de colocar sempre o ferro no respectivo suporte após cada utilização e deixe-o arrefecer antes de o guardar.
5. Utilize sempre os sistemas da PACE em locais bem ventilados. Um Sistema de extracção de fumos, como os Sistemas disponiveis na PACE, são altamente recomendados para a protecção dos utilizadores contra os fumos produzidos pela solda e fluxo.
6. Tenha precauções apropriadas ao utilizar produtos quimicos (ex. pasta de soldar). Lêr sempre atentamente os normas de segurança fornecidas com cada produto químico e siga sempre todas as precauções de segurança recomendadas pelo fabricante.

### Guías de Consulta de Seguridad, Español Lenguaje

Lo siguiente es precauciones de seguridad que el personal debe entender y debe seguir al usar o reparar productos de PACE.

1. **RIESGO de SHOCK POTENCIAL** - Los procedimientos de la Reparación en productos de PACE sólo deben ser realizados por Personal de Servicio Calificado. Pueden exponerse partes de voltaje de línea cuando el equipo se desmonta. El personal de servicio debe evitar contacto con estas partes al arreglar el producto.
2. Para prevenir lesión del personal, adhiera a las reglas de seguridad de acuerdo con OSHA y otras normas de seguridad aplicables.
3. Las herramientas SensaTemp tienen sus calentadores y las puntas instaladas calientes cuando la herramienta esta encendida y por un periodo de tiempo después de apagar el equipo. **No toque el calentador o la punta.** Las quemaduras severas pueden resultar.
4. El Soporte de punta y Herramienta PACE se diseñan específicamente para el uso con las herramientas asociadas y las almacena de una manera que protege al usuario de las quemaduras accidentales. Siempre guarde la herramienta en su soporte. Esté seguro de poner la herramienta en su soporte después del uso y permita que la herramienta enfríe antes de guardar.
5. Siempre use sistemas de PACE en una área bien ventilada. Un sistema de extracción de humo como esos disponibles de PACE se recomiendan para ayudar a proteger al personal contra los humos de flujo de soldadura.
6. Ejercicie las precauciones apropiadas al usar químicos (ej., pasta de la soldadura). Refiérase a la Hoja de Datos de Seguridad de Material (MSDS) proporcionado con cada químico y adhiere a todas las precauciones de seguridad recomendadas por el fabricante.

## Säkerhetsföreskrifter, Svenska

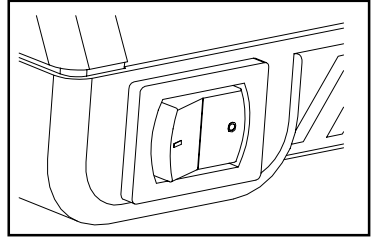
Följande säkerhetsföreskrifter måste förstås och följas av personal som använder eller utför service på PACE produkter.

1. **RISK FÖR STRÖMSTÖT** - Service / Reparation av PACE produkter får endast utföras av aktoriserad service personal. Strömförande delar kan komma åt när produkten är isärplockad. Iakttag akksamhet när felsökning görs för att undvika strömstötar.
2. För att undvika personskada rekommenderas att OSHA eller andra liknande arbetssäkerhets standarder följs.
3. SensaTemp verktygselement och installerade spetsar är heta när strömmen är påslagen och en tid efter att strömmen slagits av. **RÖR EJ** element eller spets. Risk för brännskador!
4. PACE Spets och Verktygshållare är speciellt utformade för att passa PACE respektive verktyg så att risken för brännskador kan undvikas. När verktyget ej används bör det alltid förvaras i sin hållare.
5. Tillse att ventilationen är god där PACE System används. Ett lödröksutsug system som t.ex. PACE tillhandahåller rekommenderas för att skydda användaren för giftig lödrök.
6. Tillse att gällande säkerhetsföreskrifter följs vid användning av kemikalier, t.ex. lodpasta. Se säkerhetsdatabladerna som medföljer kemikalierna och följ de rekommenderade säkerhetsföreskrifterna från respektive tillverkare.

### Set-up

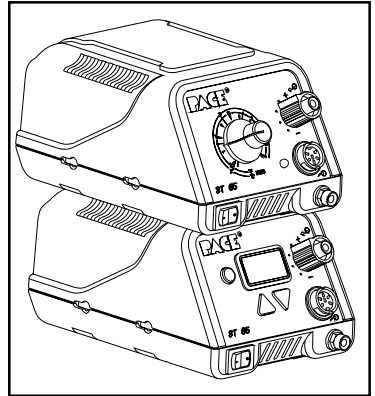
Set up the ST 65 system using the following steps and associated drawings.

1. Store the shipping container(s) in a convenient location. Reuse of these containers will prevent damage if you store or ship the system.
2. Place the Power Switch in the “OFF” or “0” position.



### Stacking

ST 25, 45, 65 & 85 systems can be stacked one on top of the other (up to 3 units high). Ensure that the power sources are positioned as shown with the recessed area in the bottom of the top power source placed over the raised portion on top of the bottom power source.



## ***Set-Up***

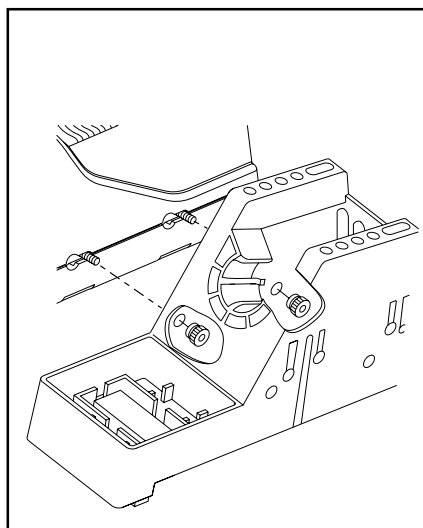
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### ***Tip & Tool Stand***

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If you have purchased a system with a handpiece, set up the Tip & Tool Stand in the following manner. If you have purchased another SensaTemp handpiece, use the instructions enclosed with the handpiece and associated Tip & Tool Stand.

1. To attach the stand to the power source, use the following procedure.
  - a) Insert the 2 Mounting Screws (head first) into the 2 power source mounting slots shown. Slide the screws toward rear of power source.
  - b) Place the Tip & Tool Stand beside the power source. Insert ends of the 2 Mounting Screws into the 2 Tip & Tool Stand mounting holes shown.
  - c) Install a Thumb Nut onto the end of each Mounting Screw. Tighten Thumb Nuts to secure the stand in position.



2. Place the handpiece into its Tip & Tool Stand.

### ***Handpiece Connection***

---

Connect the handpiece connector plug into the Power Receptacle in the following manner.

1. Align guide on connector with slot on power receptacle.
2. Insert connector into power receptacle.

### Air Supply Connection

The ST 65 system utilizes an integral air venturi system to provide air pressure and vacuum for any connected PACE SensaTemp air handpiece. Your in-house air supply (regulated to 5.48 Bar (80 P.S.I.); see "Specifications") must be connected to the system power source.

#### CAUTION

The system must be connected to a clean, dry, and filtered air supply regulated to 5.48 Bar (80 P.S.I.); see "Specifications". Connection to a contaminated air supply or one with pressure in excess of 6.16 Bar (90 p.s.i. may cause damage to the power source.

1. Attach a length of Small, Flexible Air Hose (not supplied) to the Air Hose Fitting on the rear of the PACE power source using the following procedure.

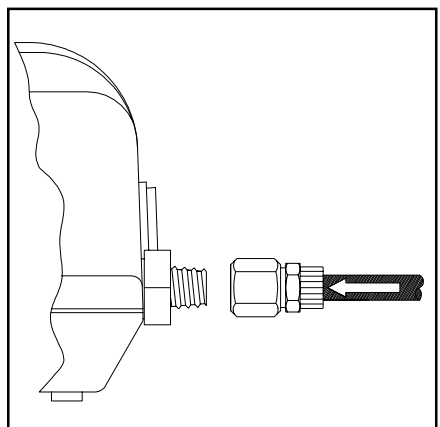
PACE does not recommend the attachment of quick connect air hose fittings to the power source. The weight of the standard large air hose lines will affect the stability of the system and would require a larger bench space.

- a) **230 VAC Systems only:** A metric adapter fitting (PACE part number 1259-0081) is included for use with 230 VAC systems.

#### NOTE

**DO NOT** overtighten connections. Damage to the system could occur if excessive torque is applied to the Air Hose Fitting, metric adapter or Connector.

- b) Install the Connector (with Small, Flexible Air Hose) onto the Air Hose Fitting (or metric adapter) finger tight. Using an appropriate wrench, tighten the Connector an additional 1/4 turn. **DO NOT** overtighten.



2. Connect the free end of the small, flexible air line hose to your air supply using the appropriate fittings.

## Set-Up

### Handpiece Vacuum/Pressure

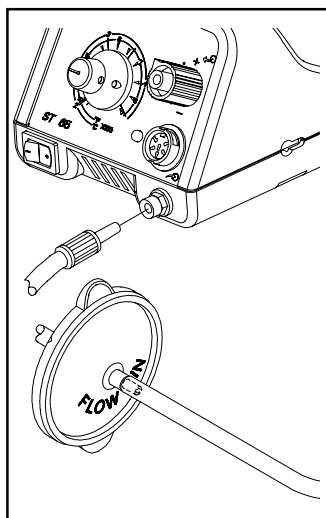
To set up your handpiece air hose connection, perform the following steps:

#### 1. Air Hose To Handpiece Connection

- Attach one end of a 137cm (54 inch) length of air hose to the metal tube in the back of the handpiece.
- If you have a PACE system incorporating only one handpiece, attach the air hose to the power cable using the supplied Hose Clamps. Space them evenly along the length of the power cable starting at a point 6 inches from the ends of the handpiece.
- If you have a PACE system incorporating 2 or more air handpieces, you may wish to leave the air hose assembly unattached to allow a quick change to any air handpiece being used.

#### 2. Prepare a VisiFilter (if needed) in the following manner:

- Connect a 1 inch (2.5cm) length of clear pvc air hose to the FLOW OUT side of the VisiFilter; push and turn the hose onto the VisiFilter nipple to seat.
- Insert the ribbed end of a male quick connect hose mount fitting (P/N 1259-0087) into the free end of the 1 inch (2.5cm) length of air hose connected to the FLOW OUT side of the VisiFilter.
- Connect the free end of the 137cm (54 inch) length of air hose to the FLOW IN side of the VisiFilter.
- Insert the end of the quick connect hose mount fitting (on VisiFilter FLOW OUT side) into the power source Vacuum Port.



#### 3. When using air pressure, and/or utilizing multiple air handpieces, PACE recommends the use of the following set up procedure which utilizes additional quick connect hose mount fittings. An assortment of quick connect air fittings are supplied with each additional air handpiece.

- Disconnect the 137cm (54 inch) length of air hose from the FLOW IN side of the VisiFilter assembly. Insert the ribbed end of a male quick connect hose mount fitting (P/N 1259-0087) into the free end of this air hose.



- b) Connect the free end of a 1 inch (2.5cm) length of air hose with an installed female quick connect hose mount fitting (P/N 1259-0086) to the FLOW IN side of the VisiFilter Assembly.
  - c) The 137cm (54 inch) length of air hose can now be easily moved between the VisiFilter Assembly and the Controllable Pressure Port. The VisiFilter assembly remains connected to the Vacuum Port.
4. Additional fittings may also be added to the hose connection at the rear of each air handpiece to ease changing of handpieces.

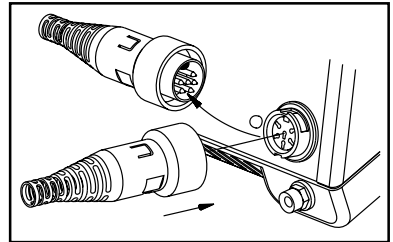
### NOTE

When removing any air hose, turn and pull. Do not attempt to pull hose directly off. Damage to or breakage of fitting or VisiFilter may occur. Use your Sodr-X-Tractor with a clean VisiFilter element. Otherwise a deterioration in performance or damage to the unit may occur.

### Handpiece Connection

Connect the handpiece connector plug into the Power Receptacle in the following manner.

1. Align guide on connector with slot on power receptacle.
2. Insert connector into power receptacle.
3. Turn the connector housing clockwise to lock in place.



### System Power Up

1. Insert the female end of the power cord into the AC Power Receptacle at the rear panel of the power source.
2. Plug the prong end (male end) of the power cord into a 3 wire grounded AC supply receptacle. The system is now ready for operation.

### CAUTION

To ensure operator safety, the AC supply receptacle must be checked for proper grounding before initial operation.

3. Read this manual and all other included manuals thoroughly before operating the system.

## ***Set-Up/Operation***

### ***Handpiece Heater Burn In***

To insure optimum performance and long life, some new handpieces must undergo a burn in procedure. A Red tag is attached to the handpiece and with replacement heater assemblies. Follow the Burn In procedure listed on the tag when setting up a new ST 65 system or when replacing a handpiece heater assembly.

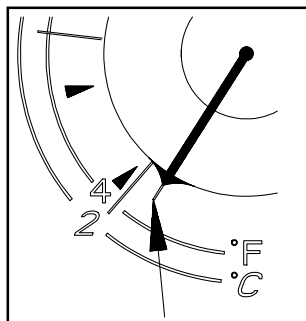
#### **NOTE**

Ensure that the system is placed in a well-ventilated area. Smoke will be emitted from the heater assembly during the burn in cycle.

### ***Temperature Selection***

#### **Variable Temperature Control**

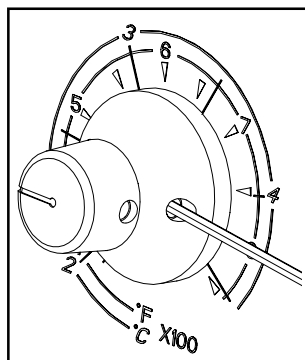
Adjust the Variable Temperature Control Knob to the desired temperature setting. Notice that the control dial has a White graphic scale denoting temperature in °C (Celsius) and a Yellow graphic scale denoting temperature in °F (Fahrenheit). These numerical scales denote the set tip temperature times 100 (e.g., “3” on the White scale is 3 x 100 or 300°C).



#### **Temperature/Dial Lock**

The Variable Temperature Control Knob can be locked in position to avoid accidental or unauthorized changes of the temperature setting. Perform the following procedure to lock the Variable Temperature Control Knob.

1. Adjust the Temp. Control Knob to the desired temperature setting.
2. Using the Temp. Locking Key (hex key supplied with system), tighten the set screw on the Temp. Locking Ring closest to the front panel.

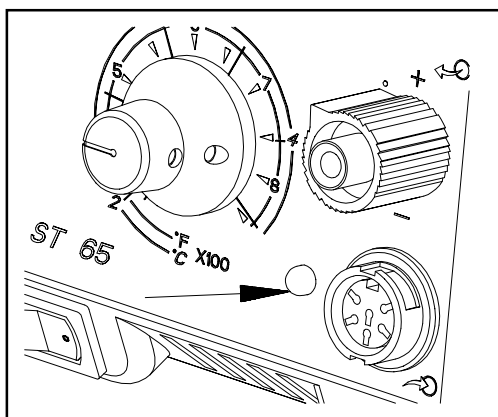


### Tip Offset

Differences between the temperature settings and true tip temperatures are negligible when using Thru-Hole, single point soldering tips. With any heating system however, True Tip Temperatures can differ greatly from temperature settings when using larger SMT soldering tips. This difference is called Tip Temperature Offset. PACE recommends the use of the Tip & Temperature Selection System booklet (PACE P/N 5050-0251) as a guide to accurately set and maintain a true tip temperature for any size and type of SMT tip.

### LED Operation

The Green colored LED on the power source front panel indicates System Status and Power Receptacle output status (LED OFF, ON or Flashing). Following is an explanation of these status indicators.



**LED Full On** - Continuous power is being delivered to the handpiece. This condition is evident when the system is first powered up (handpiece heater cold) or the Variable Temperature Control setting is increased.

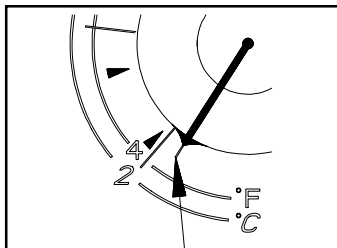
**LED Flashing** - Indicates that the set tip temperature (as set on the Variable Temperature Control) has been reached. Power to the handpiece is cycling Off and On to maintain set temperature.

**LED Off** - No power is being delivered to the handpiece heater. This condition is evident for a short period of time when set temperature is reached and stabilizing or if the Variable Temperature Control setting is decreased. If the LED never illuminates, check for a faulty handpiece (see Corrective Maintenance section). Also, if no handpiece is connected to the power source, the LED will not illuminate.

## Calibration

The ST 65 system is tested for temperature accuracy at the factory and can be checked for calibration according to PACE requirements. Also, a temperature setting normally used by the operator can be adjusted to the precise temperature indicated on the Dial/Display. No internal adjustments can be made to the power supply. To verify calibration of the power supply, perform the following procedure.

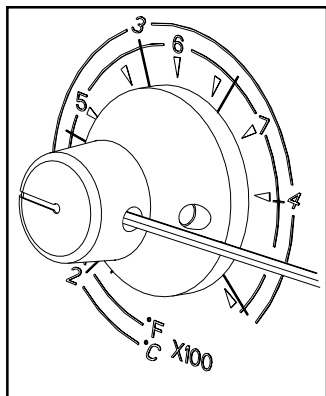
1. Install a tip with an attached thermocouple wire into the handpiece connected to the system. Tips with K type thermocouples are available from PACE; use part number 7021-0004-P1 when ordering.



2. Connect the thermocouple assembly to a PACE Process Monitor (part number 8001-0077 or 8001-0078) or appropriate temperature meter.
3. When set fully counterclockwise, the pointer of the Variable Temperature Control knob will align to the Calibration Mark as shown. With the system turned on, adjust the Variable Temperature Control to obtain a stable tip temperature of 300°C (for PACE factory specifications) or the temperature setting normally used by the operator.

If the temperature displayed on the Process Monitor (or temperature meter) is within  $\pm 15^{\circ}\text{C}$  ( $27^{\circ}\text{F}$ ), perform steps 4 thru 6 to obtain a precise reading. If the temperature is off by more than  $\pm 15^{\circ}\text{C}$ , the handpiece may require maintenance. Recheck the temperature using a second handpiece.

4. Carefully lock the Variable Temperature Control in position by tightening the inner set screw (closest to front panel).
5. Loosen the outer set screw on the Variable Temperature Control knob (furthest from front panel) using the Temp. Locking Key (hex key) supplied with the system. Position the knob with the pointer aligned to match the temperature indicated on the Process Monitor (or temperature meter). Secure the knob in position by tightening the outer set screw.
6. Loosen the inner set screw to unlock the Variable Temperature control if adjustment of operating tip temperature is desired.



### ***Power Source***

Most malfunctions are simple and easy to correct. Refer to Table 1 below to clear these malfunctions.

Symptom	Probable Cause	Solution
No power to system.	Blown Fuse	Check handpiece using Table 2. Replace the fuse (located in the AC Receptacle/Fuse Holder) with one of same value (see Table 4, Spare Parts).
No heat on handpiece.	Defective Heater	See Table 2.
No vacuum or air pressure at handpiece.	House air supply not connected.	Check house air supply connection to power source.
	Kinks in handpiece air hose.	Remove kinks or replace air hose.

*Table 1. Power Source Corrective Maintenance*

# Corrective Maintenance

## Handpieces

The following “Heater Assembly Checkout Procedures” (Table 4) is applicable to all PACE SensaTemp handpieces used with the ST 85 system except for the TT-65 and DTP-80 handpieces. Refer to the applicable manuals for troubleshooting procedures pertinent to that handpiece.

Perform the procedures with the handpiece heater at room temperature. If the heater is warm, resistance readings will be different from those shown. Disconnect the handpiece from the power source. Use a meter to check resistance across the handpiece connector plug pins as outlined in the “Checkout Procedure” column.

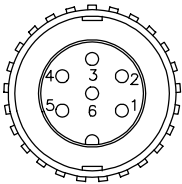
Symptom	Checkout Procedure	Cause	Solution	Heater Specifications
Handpiece does not heat.	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is high - -	Open Heater	Replace Heater Assembly.	<b>P S - 80 = 8-10 ohms</b> <b>SX-80 = 8-10 ohms</b>
	Check resistance - Pin 3 to Pin 6. If circuit reads open - -	Open Sensor	Replace Heater Assembly.	<b>SX-70 = 8-10 ohms</b> <b>TP-65 = 9-11 ohms</b>
Handpiece overheating; LED off.	Check resistance - Pin 3 to Pin 6. Resistance should be 110 ohms. If resistance is less than 105 ohms - -	Shorted Sensor	Replace Heater Assembly.	<b>TJ-70 = 6 - 8 ohms</b>
Fuse blows when unit is turned on.	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is low - -	Shorted Heater	Replace Heater Assembly & Fuse.	 <b>Connector Plug Pinouts</b>
No Ground on Tip.	Check resistance - Pin 4 to a NEW Tip. Resistance should be less than 2 ohms. If not - -	Oxidation in Heater Bore.	Clean Heater Bore using appropriate wire brush.	
		Defective Heater	Replace Heater.	

Table 2. Heater Assembly Checkout Procedures

## *Packing List/Spare Parts*

### ***Packing List***

This is a packing list of the items shipped with the system and is current at the time of publication of this manual.

<b>PACKING LIST</b>			<b>Quantity Supplied</b>			
			<b>ST 65 Systems</b>		<b>ST 65-SX80 Systems</b>	
<b>Item #</b>	<b>Description</b>	<b>Part Number</b>	<b>ST 85</b>	<b>ST 85E</b>	<b>ST 85</b>	<b>ST 85E</b>
1	ST 65 System Power Source	-----	1	1	1	1
2	SX-80 Handpiece, (48 Watts)	6010-0106	0	0	1	1
3	Power Supply Cord, 115 VAC	1332-0094	1	0	1	0
4	Power Supply Cord, 230 VAC	1332-0093	0	1	0	1
5	Tip & Tool Stand Kit	6019-0060-P1	0	0	1	1
6	SX-80 Accessory Kit	-----	0	0	1	1
7	Air Fitting Adaptor	1259-0081	0	1	0	1
8	Tip Tool	1100-0206	1	1	1	1
9	Hex Key Tool	-----	1	1	1	1
10	Operation & Maintenance Manual	5050-0454	1	1	1	1

*Table 3. Packing List*

### ***Spare Parts***

<b>Item #</b>	<b>Description</b>	<b>Part Number</b>
1	Fuse, 1.0 Amp Time Lag (ST 65)	1159-0246
	0.5 Amp Time Lag (ST 65E)	1159-0213
2	Replacement PCB Assembly	6020-0125-P-1
3	Tip & Temperature Selection System Booklet	5050-0251

*Table 4. Spare Parts*

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## **LIMITED WARRANTY**

PACE warrants that this equipment will be free of defects in materials and workmanship for a period of one (1) year from the date of receipt by the first user.

This warranty does not cover repair or replacement required as a result of misuse, mishandling or improper storage. Failure to perform recommended routine maintenance, alterations or repairs made other than in accordance with PACE's directions, or removal or alteration of identification plates in any way will void this warranty. This warranty is available only to the first user, but the exclusions and limitations therein apply to all persons and entities.

This warranty does not apply to consumable items, such as tips, filter elements, hoses, collection chambers etc., except that heaters are normally warranted for a period of six (6) months from the date of receipt by the first user.

**PACE MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**

PACE will, at its option, repair or replace any defective equipment or parts at its facility or other location approved by it at no charge to the user, or provide parts without charge for installation by the user in the field at user's expense and risk. User will be responsible for all costs of shipping equipment to PACE or other warranty location for warranty service.

**EXCEPT FOR THE REMEDY ABOVE DESCRIBED, UNLESS OTHERWISE REQUIRED BY APPLICABLE LAW, PACE WILL HAVE NO OTHER OBLIGATION WITH REGARD TO ANY BREACH OF WARRANTY OR OTHER CLAIM WITH RESPECT TO THE EQUIPMENT, OR LIABILITY FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, OR INCIDENTAL LOSS OR DAMAGE CAUSED BY OR OCCURRING IN CONNECTION WITH ANY OF THE EQUIPMENT.**

To obtain warranty service, contact the appropriate PACE company listed below

PACE Inc. 9893 Brewers Court, Laurel, Maryland 20723-1990  
Tel. (888) 535-7223 (toll-free) Warranty Service FAX 301 483 7030

PACE Europe Ltd. Sherbourne House Sherbourne Drive Tilbrook Milton Keynes  
United Kingdom MK7 8HX  
Tel. (44) 01908 277 666 Warranty Service FAX (44) 01908 277 777

Do NOT return defective equipment or parts to PACE without obtaining prior authorization.

Any warranty or other claim with respect to the equipment must be made in writing and delivered to PACE (or local authorized PACE Distributor outside the U.S.) within a reasonable time of the expiration date of this warranty. Sufficient evidence of purchase and date of receipt must also be included, otherwise user's rights under this warranty shall be deemed waived.